

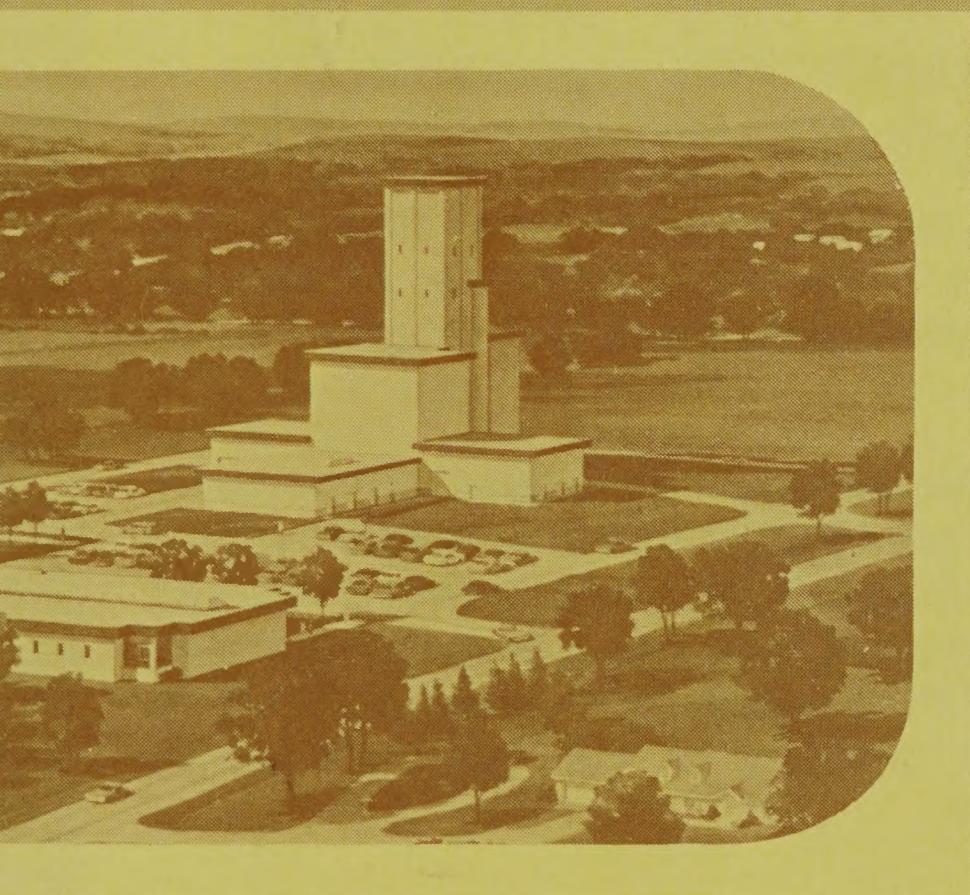
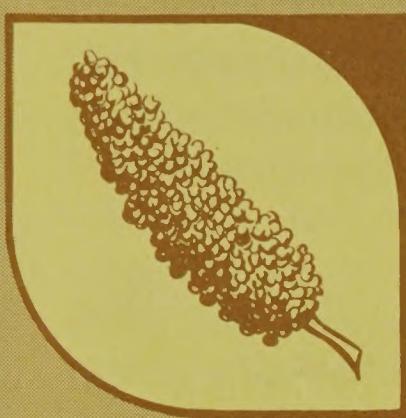
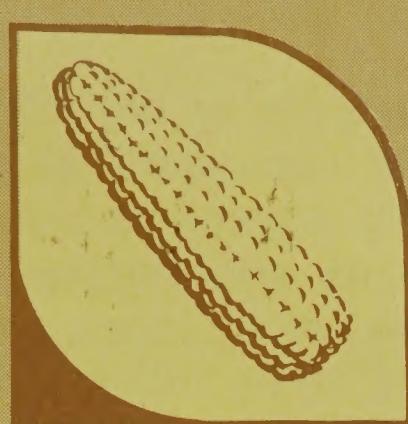
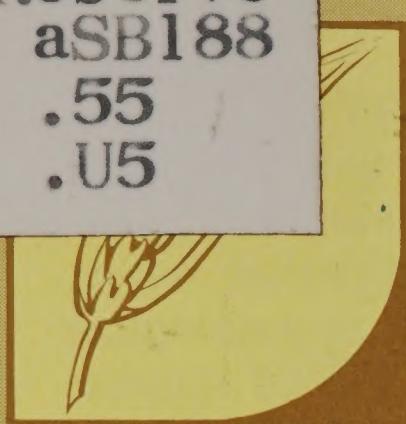
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U.S. GRAIN MARKETING RESEARCH LABORATORY

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U.S. DEPARTMENT OF AGRICULTURE -
SCIENCE AND EDUCATION ADM.
AGRICULTURAL RESEARCH
NORTH CENTRAL REGION

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Scientists at the U.S. Grain Marketing Research Laboratory study grain — from harvest to storage to processing. Research emphasizes maximizing nutritional value, consumer acceptance, and technological versatility while minimizing energy requirements and maintaining soundness and overall quality during handling, conditioning, and storage. Major research concerns wheat, sorghum, and corn; other investigations include rice, barley, oats, soybeans, and triticale.

Located in Manhattan, Kansas, the laboratory is administered by the Agricultural Research arm of the Science and Education Administration. It was built in 1971 on a 12-acre tract of land deeded to the U.S. Department of Agriculture by the State of Kansas. A focal point for grain marketing research, the laboratory is in the North Central Region, which includes 13 states that produce more than two-thirds of all U.S. wheat, corn, and soybeans.

Laboratory facilities include three buildings: a laboratory-office building with 56,000 square feet of floor space; a pilot plant with 18,000 square feet; and a grain elevator that has a 156-foot high head-house and a grain storage capacity of approximately 50,000 bushels.

Research is conducted in cooperation with Kansas State University, and an extramural program is conducted in cooperation with several universities, industries, and scientific institutes.

Organization of the Laboratory

On-going, mission-oriented investigations on grain marketing are conducted in the following laboratory research units:

Grain Structure and Composition

Biological

Engineering

Grain Quality and End-Use Properties

Grain Quality Characterization

Economics, Statistics, and Cooperatives Service

Grain Structure and Composition Unit

Scientists here conduct investigations to determine (a) composition of cereal grains in relation to nutritional value, storage, handling, and utilization; (b) structure of cereal grains in relation to storage, handling, and utilization; (c) use of enzymes and enzymatic activity to determine composition, storability, and damage during handling of cereal grains; (d) chemical classification of cereal grains, particularly corn and sorghum, to determine nutritional quality; and (e) methods to determine molds and mycotoxins in cereal grains.

Biological Research Unit

In this unit, scientists are concerned with fundamental and applied biology of insects and microorganisms that infest stored grains and cereal products. Their primary mission is to gain adequate knowledge of such organisms and the storage environment to develop appropriate techniques and methods of pest management under experimental and practical conditions. Research is concentrated in five general areas: (a) insect

physiology, biochemistry, and endocrinology; (b) pesticide biochemistry, physiology, and toxicology; (c) insect pathology; (d) pest bionomics; and (e) genetic resistance in seeds.

Engineering Research Unit

The work of this unit encompasses three areas of research: (a) minimizing fuel energy required for grain drying; (b) measuring and controlling dust from grain handling to minimize health hazards and dust explosions; and (c) reducing damage to grain from handling. The unit has several minicomputers that are used to support the laboratory in collecting and analyzing data. The computers, linked to specific machines, are available to interface with a variety of custom-design, input-output devices and to analyze and plot data.

Grain Quality and End-Use Properties Unit

Activities in this unit are concerned with (a) identifying physical and structural characteristics and chemical components of grain that govern or are associated with functional properties; (b) developing, improving, and evaluating methods and instruments that can be used to objectively, rapidly, and accurately characterize and evaluate grain in domestic and export marketing channels; and (c) cooperating with plant physiologists, entomologists, and biochemists at Kansas State University and the U.S. Grain Marketing Research Laboratory by providing milling, baking, and biochemical expertise and support for selective projects of mutual interest.

Grain Quality Characterization Unit

Scientists in this unit conduct research on chemical, biochemical, physical, and physicochemical methods for determining the quality of cereal grains. Information from these investigations is used to develop methods for evaluating cereal grains and developing, in cooperation with the Agricultural Marketing Service and the Federal Grain Inspection Service (USDA), proposals for modifications, improvements, or both, in the grain standards.

Economics, Statistics, and Cooperatives Service

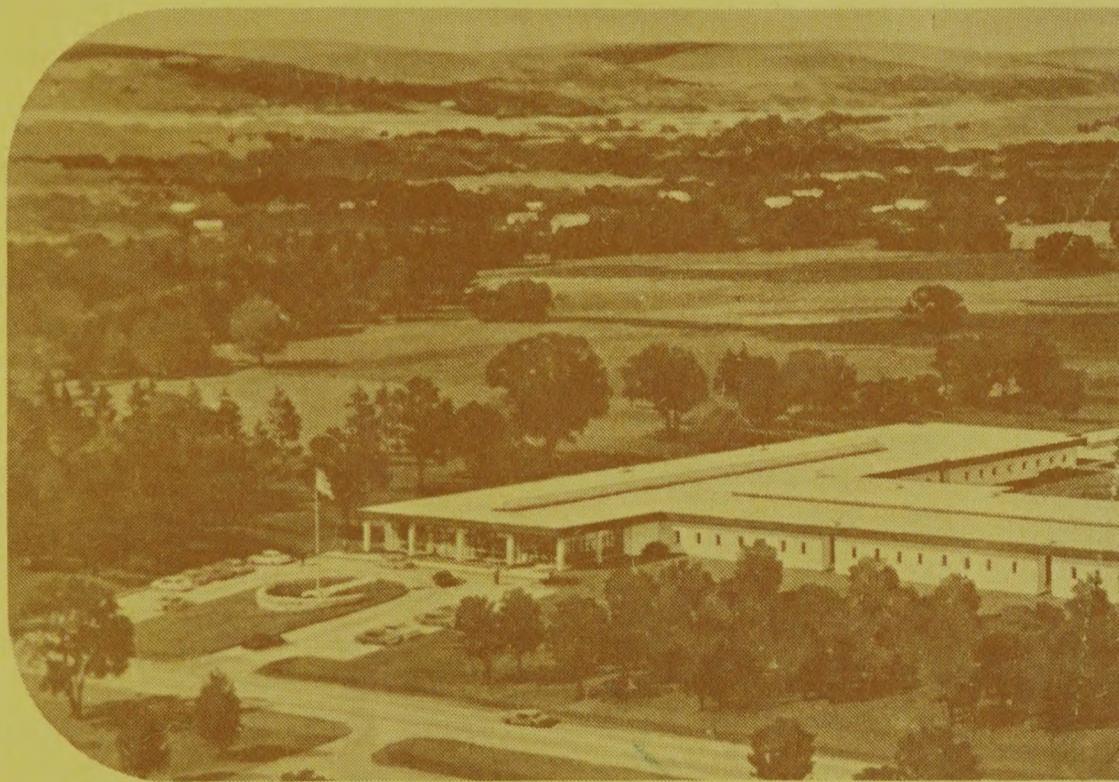
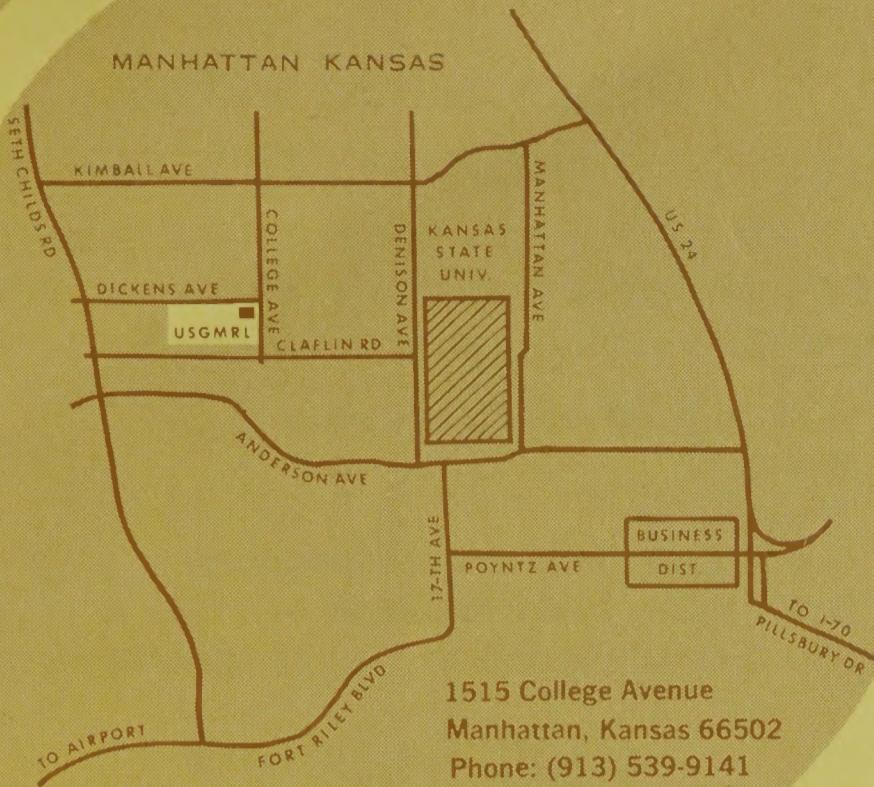
Studies here concern the economic aspects of producing, storing, handling, transporting, and processing functions in the U.S. grain industry. Research focuses on wheat and feed grains, as well as on processed grain products. This unit of economists works in close cooperation with SEA-AR personnel to strengthen the interdisciplinary research approach at the U.S. Grain Marketing Research Laboratory.

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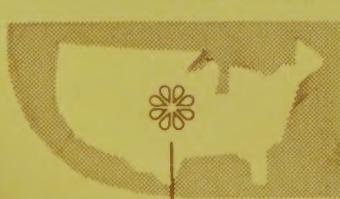
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MANHATTAN KANSAS



RESEARCH
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